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12 PAGES.

CLINICS.

CLINICAL LECTURE.

Lectures on Vaccination.—By GRAILY HEWITT, M. D., &c. Delivered at St. Mary's Hospital Medical School. Lecture II.

GENTLEMEN: The facts brought before your notice in yesterday's lecture will have demonstrated to you the great amount of difference which exists between the protective effects of good and bad vaccination, and you will understand therefore the importance attaching to all questions connected with

THE OPERATION OF VACCINATION.

And first as to the selection of lymph to be used in vaccinating. There are many circumstances connected with the selection of the lymph which are capable of interfering with the success of the vaccination. If the lymph be taken too late, the products of the vaccination tend more and more towards those of common inflammation, and the specific virus does not exist in the proper degree of intensity. The operation is apt, under these circumstances, to produce vesicles, which inflame too soon, and which run an irregular course. The vesicle thus produced is termed an abortive vesicle. If the lymph used be taken from a vesicle which is in a purulent condition no proper vaccination results, but the chances are that phlegmonous inflammation of the arm will be produced. It is improper to take lymph if there be much local irritation, if the arm be very much inflamed, or if there be great constitutional disturbance. As bearing on this subject, it may be here mentioned that Mr. Henry Lee has recently called attention to an important means of distinguishing between good and bad lymph—viz., the employment of the microscope. Good lymph is perfectly clear, and contains no admixture with pus corpuscles. Such corpuscles are present, or may be present, if the lymph be bad. The fact that the fluid examined is transparent proves nothing, of course, as to its capability of producing the

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vaccine disease, for a perfectly inert fluid may possess the negative qualities in question. The criterion is, however, valuable in cases where we are about to use lymph preserved in the fluid state of the history of which we are ignorant. Syphilitic patients should be avoided, and it is better also to avoid taking lymph from cases in which there is any eruption present. There are very few cases on record the facts of which in any way support the theory that other diseases can be conveyed from individual to individual by means of the lymph, and the question can scarcely be said to be scientifically decided in the affirmative at present. While, however, it remains so undecided, it is well to be on the safe side.

Which is the best time to take the lymph? The best time to take the lymph, if the vesicle be running its proper course, is at the end of one week from the date of the vaccination—that is to say, on the day week of the vaccination, at the same hour. At this time the vesicles are usually in perfection, and contain a quantity of lymph; this time is also just that which precedes the formation of the areola. If there be a very marked areola, which has been in existence upwards of twenty-four hours, it is proper to follow the rule laid down by Mr. Marson on the subject, and to avoid taking lymph from vesicles under such circumstances. On the eighth day we ordinarily see the formation of the areola just commencing: this is the proper time to take the lymph.

What are the limitations as to the time at which lymph may be taken? Mr. Ancell strongly maintains the opinion that the lymph ought to be taken one day earlier than it usually is—that is to say, at the end of the sixth day, or during the seventh; but it is almost the universal practice to take it on the eighth. It should not certainly be taken earlier than the seventh or later than the ninth day; and it would probably save much disappointment and inconvenience to make the rule absolute, not to take lymph later than the eighth day.

In some cases there is, as was mentioned in the last lecture, what is termed "retardation" of the vesicle; and it is possible that a good deal of the inefficient and imperfect vaccination is due to perpetuation of an imperfect type of the disease, originally starting from the use of the lymph from "retarded" or "premature" vesicles. There can be no

doubt that, as like tends to produce its like, so one variety of the vaccine disease perpetuates itself, and a weak form of the disease is liable to be produced where this principle is not recognized. The arm to be vaccinated from, may be a "good arm," the disease running a normal course, but it may not be a good one from which to take lymph nevertheless. This is a very important part of the question. Recently I made it my business to visit Mr. Marson's station at the Surrey Chapel, and witness his procedure: he then informed me of a circumstance very accurately illustrative of the point now under discussion. On the day of the marriage of the Prince of Wales no children were presented for vaccination

at the station in question, and the following week there was consequently no means of carrying out the usual arm-to-arm vaccination, the continuity of the liquid supply being broken. Mr. Marson was thus driven to use preserved lymph to vaccinate twenty-two children on that day. The effect was, that the lymph for some time afterwards, although it took effect, did not produce such fair vesicles as before the interruption; but the interesting fact now remains to be told—viz., that by selecting the best arm of the day to vaccinate from, Mr. Marson has now worked it back again to as good a state as before. The lesson conveyed by the facts related to me by Mr. Marson is most valuable from more points of view than one.

The condition of the patient who is to be vaccinated must next be considered. What

is the time at which vaccination may be performed? It may be performed during the first week after birth, or even immediately after birth; there is no practical reason against it. If smallpox be very prevalent, early vaccination should be practised; usually it is postponed till about three months after birth. As will be presently shown, there are circumstances which may render it advisable to postpone the performance of the operation a little beyond the three months, where the postponement is made for the purpose of performing the operation more efficiently. The child to be vaccinated should have no disease—no fever especially; and it is well to cure the patient of eruptions before performing vaccination. If vaccination be performed on an individual who has just been subjected to the influence of contagion of smallpox, the vaccination will have the effect of miti-

gating the disease which has already seized on the patient, and vaccination should be practised without a moment's delay under such circumstances. I am not quite certain that it is absolutely proved, but the facts which are on record lend very great probability to the view taken by Dr. Budd and others on the subject. "It is natural to infer," says Dr. Budd, "that if vaccination be practised immediately after the infection of smallpox is communicated, it will get the start of the smallpox, and so will have the effect of mitigating it."

Should the lymph be used fresh, or should preserved lymph be used? The exceedingly valuable results of the inquiry recently made by order of the Privy Council as to the manner in which vaccination has been performed in certain parts of England,¹ furnish us with abundant materials for determining the advantages and disadvantages respectively of fresh and preserved lymph. This report refers to 135 unions and parishes, the facts relating to which were collected and reported on by Dr. Serton, Dr. Stevens, Dr. Sanderson, and Dr. Buchanan. It will be sufficient to examine the data afforded in one of the localities inspected. In the twenty-seven unions the field of Dr. Buchanan's observations, "vaccination was done," says that gentleman, "as follows: Nine vaccinators operated either exclusively, or nearly so, from arm to arm—that is, using fresh lymph;)—thirty-one do the majority of their vaccinations in this way; sixty others operate usually with dry lymph, still doing some proportion from arm to arm; forty-four do all their vaccinations with preserved lymph, or rarely in any other way." Now mark the result of this: "After an examination of the cicatrices produced by the vaccinators in the four groups, it may be broadly affirmed that the average of insertion success and the average of quality, are both notably higher among the arm-to-arm vaccinators than among those who use preserved lymph; and, therefore, it is highly probable that vaccination from arm to arm conduces to good and efficient results, while vaccination with preserved lymph gives fewer scars, and is of a less protective kind." And in another passage Dr. Buchanan observes that he found a very near connection subsisting be-

tween the insertion success of the operator and the quality of the cicatrices produced by him. These are results of a widely extended inquiry, and they are confirmatory of what every private practitioner must have found to be the case—that the arm-to-arm vaccination, in which fresh lymph is used, is undoubtedly the most successful. The anecdote just referred to of Mr. Marson's experience on a very recent occasion, is strikingly corroborative of the view, that fresh has a great superiority over preserved lymph.

Mr. Marson has since kindly furnished me with further details of what occurred on the occasion in question. The twenty-two children were vaccinated in the following manner: with charged points in three places on the left arm, and with lymph from tubes in three places on the right arm. All the places of insertion from points took effect except in one child, and this took but in one place from points. The arms done from points had by far the best vesicles. Many of the arms done with lymph from tubes missed in one or two places; one missed entirely from tubes.

Finally, it must be laid down as a principle having for its sanction every conceivable support from facts, that vaccination to be thoroughly efficient, reliable, and satisfactory, must be done by the arm-to-arm method. No other mode of vaccination should be systematically practised or sanctioned, and recourse should be had to preserved lymph only on extraordinary occasions, and when circumstances are such that it is impossible to procure recent lymph.

What is the best means of preserving lymph? The ivory points and the capillary tubes—the latter introduced by Mr. Husband—are the only two methods to be recommended. The glass bottle sometimes employed is exceedingly objectionable, unless in cases where the lymph is to be used very shortly after being taken from the arm, for the lymph so kept is apt to become putrid, and serious consequences would result from vaccinating with lymph so changed. For carrying lymph from one house to another the bottle is occasionally very useful; it should not be used if more than a few hours old. The capillary tubes are not liable, with ordinary care, to the objection just referred to, and the lymph may be kept in them fluid and efficacious for a great

¹ Fourth Report of the Medical Officer to the Privy Council. Ordered by the House of Commons to be printed, April 11th, 1862.

number of years. The ivory points are most largely in use, and are economical when a large supply has to be obtained from a single arm. The chief objection to the ivory point method of preservation is the uncertainty as to insertion success by their means—a point to be presently referred to. It would appear that the tubes have a superiority over points, judging at least from the results obtained by various operators. (Mr. Marson's late experiment tended to give the points the superiority.) Whether tubes or points be employed, care must be taken in the preservation. The tubes should be small; they should be half filled [the manipulations necessary in so filling them were here practically exhibited], and the fluid shaken into the centre of the tube. Both extremities of the tube being then free from fluid, the sealing is rapidly effected in the border of the flame of a candle, the heat being applied in such a manner that the fluid is unaffected by it; for it is hardly necessary to say that by boiling, the efficacy of the lymph is utterly destroyed. Care should be taken that no blood passes into the tube.

Mode of operating.—Mr. Marson's directions on the subject are as follows: "The arm to be vaccinated should be firmly grasped by the left hand of the operator, so as to make the skin tense; then the lancet, being already charged with the lymph, should be introduced by a puncture of a valvular shape, from above downwards, so managed that the lymph at each puncture may gravitate into the wound. In this way the lymph may be introduced in five punctures, the number I recommend, from half an inch to three-fourths of an inch apart, without recharging the lancet, the skin being kept tight all the while, until enough has been introduced; care being taken that the punctures are not bruised, as too frequently happens, by an undue use of the lancet. It then matters not how much the wounds may bleed, as the bleeding will not interfere with the success of the operation." Mr. Marson's method, as practised by him and by the majority of public vaccinators on a large scale, insures a very high degree of insertion success, the operation failing to take in an exceedingly small number of instances only.

Before criticizing this method of perform-

ing the operation as adapted to *all* cases and under all circumstances, let us turn for a moment to the results of Dr. Buchanan's inquiries as regards the method of operating in the country districts inspected by him. This is a better indication of what the proper method is than Mr. Marson's results, for a reason I shall presently explain. In 121 cases, Dr. Buchanan found that "eighty-eight individuals operated by puncture, drawing only a little blood; four made a deeper puncture into the true skin; five made compound puncture for each vesicle—a number of little punctures, and close together; seventeen made a superficial abrasion over a small area of skin, and then applied the matter; and seven applied the matter along a scratch. It was found that abrasion gave the largest and most typical scars; the alveoli were best marked; and several vaccinators operated in this way whose results were models of what vaccine scars should be. Moreover, the numerical success was very great. Some cicatrices were very good, and some very bad, and it seemed to be of more consequence to this method of operating whether the lymph were fresh or preserved. The deep punctures failed comparatively often." Dr. Buchanan found that the insertion success of different operators varied as much as from 0.40 to 0.72 and 0.84. There was thus a remarkable difference subsisting between the insertion success of different operators: some operators succeeding in producing a vesicle in eighty-four out of every hundred of the punctures, others succeeding only in forty-two out of every hundred. It is a matter of exceeding importance that the operation should be performed in such a manner as to insure a high insertion success, numerically speaking. Once the child has been vaccinated, if the vaccination have taken at all, the operation is at an end, and the individual remains afterwards with the degree of protection afforded by the first vaccination, whatever that may be. A child in whom, for instance, the arm has taken in one place, remains protected only to that extent, and it is not possible subsequently (except very rarely) to confer a greater degree of protection by a better vaccination. The arm will not "take" again in the regular way.

Hence it becomes a very interesting question, why is it that one operation succeeds better than another. In the first place,

it is to be remarked that there is a great difference between the results of public and private operations. This depends, first of all, upon the larger number of cases which the public operators have, and the fact that they almost always use fresh lymph, of which they have a plentiful supply. Further, the frequent practice of the operation imparts facility and dexterity in its performance. Private practitioners have frequently to use preserved lymph, and they have to perform the operation not rarely under certain other disadvantageous circumstances.

On the whole, it appears desirable to recommend to you the adoption of the following method, as one most likely to insure a large percentage of insertion success. A very sharp lancet should be used; it should be perfectly clean and free from rust. The arm being grasped so as to tighten the skin, and the lancet well charged with lymph, a series of four very minute punctures are to be made very close together, the lancet being held in a somewhat oblique direction. These four punctures are so close together as to leave an almost imperceptible space between them, and it is intended to produce one vesicle only by the four punctures. Five or six sets of punctures should be made, according as it is deemed advisable to produce five or six scars, and it is a matter of indifference whether one arm or both arms be operated on. The object of making four minute punctures for each scar is to insure the introduction of the lymph, and to increase the probability of insertion success. The lancet should be recharged before making each of the sets of punctures. The punctures should go just deep enough to draw blood. The operation should be performed, not quickly, but deliberately, as this will give more time for the lymph to run from the lancet into the minute wounds thus made. I believe that this is the best method to be recommended to you as beginners, and that in this way a good insertion success may be secured. Another good method is to slightly abrade the surface by means of the lancet used, just as an eraser is used, or to scratch the skin by the point of the lancet, afterwards rubbing in the lymph by means of the lancet handle. Weir's instrument is specially adapted for the scratching operation. Spratly's instrument is a lancet with a groove on one side to facilitate the running of the lymph into the wound; it is highly spoken of by some operators.

In order to charge the lancet, the surface of the vesicle is to be slit up or pricked in several places; the epidermis only is to be cut, and no blood should be drawn. The lymph then runs out, collects in drops on the surface, and the lancet is charged by dipping the point in the lymph so exuded. If you attend, as you should do, for further instruction at one of the public vaccination stations of the metropolis, you will find that the vaccinations are there performed with remarkable rapidity; but this rapidity of performance is not to be recommended to beginners. Until you have had some experience in vaccination, you will fail comparatively often by vaccinating in the rapid and more ordinary method. One method is not the best for all operators. The best method is that which each individual operator finds to succeed the best, and in which he has acquired the necessary dexterity.

If lymph preserved in capillary tubes be employed, the ends of the tube are broken off, and the contents of the tube blown out for use on the back of a knife or lancet, and the operating instrument is then charged as usual. If points be used, one should be employed for each spot of insertion. The ivory point is dipped for a moment in water, and placed on the edge of a book for a couple of minutes or so, in order to moisten the dried lymph, and it is then inserted into an incision made by the lancet in the skin. It should be held in the wound for a minute or two longer. A plan found to answer well in some cases is to raise the epidermis by means of a minute blister applied some hours previously in several places, and to insert the ivory point beneath the raised epidermis.

Inspection of the arm subsequently.—It should be made a rule to inspect the arm on the eighth day, and the results of this inspection should be accurately registered; otherwise cases in which vaccination does not take, may, through ignorance on the part of the mother, remain really unvaccinated, and consequently unprotected. It is hardly necessary to remark that the arm must be protected from rubbing,¹ from irritation, or other injurious influence, while the disease is in progress; and the febrile disturbance, when excessive, requires to be

¹ In the case of an adult recently revaccinated I have reason to know that neglect of these simple precautions resulted in inflammation of the arm of a troublesome and even alarming nature.

met by appropriate remedies. Under all circumstances, a case of vaccination requires careful watching.

The causes of the late apparent failure of vaccination.—It will be well to devote a short space to the consideration of the apparent failure of vaccination as protective from smallpox. The epidemic of smallpox with which we have just been visited, and which has affected so many districts of the metropolis, has given rise to much alarm, and to a certain amount of distrust as to the protective power of vaccination. Why is it that vaccination has apparently failed in its object? In the first place, there is an absence of vaccination, numerically speaking. A number of individuals are not vaccinated at all. There is a tendency in the mind of the public to become apathetic on the subject. Smallpox having ceased to ravage the country to that dreadful extent which was formerly the case, the dread of smallpox has become in a manner quieted, and vaccination has been consequently less attended to. Something also must be set down to the direct opposition vaccination has met with in certain quarters. It is only two or three years since that a medical man, in his place in Parliament, made it his business, from session to session, to preach against vaccination. His speeches, which appeared from day to day in the journals and were read by numbers of individuals, doubtless had no insconsiderable effect in inducing many to believe in the statements made as to the injurious effects of vaccination. Many who read these speeches, it must be recollect, had not Mr. Simon's Blue Book at hand as a corrective. The numerical deficiency of vaccination depends upon a variety of causes, which it is not difficult to trace; and under these circumstances it becomes certainly the duty of the Government to enforce the universal practice of vaccination, as well as an efficient performance of the operation. The supervision of the performance of vaccination is at present intrusted to the guardians of parishes; but this system is evidently a very defective one, and it is not in the nature of things that vaccination can be fully and extensively carried out unless under the direction and rigid superintendence of some one body intrusted with ample powers for enforcing attention to rules and regulations. Amongst other things, it is absolutely essential that a more liberal remuneration be given to those on whom the arduous

task falls of performing vaccination on the children of the poorer classes of the community.

The presence of large numbers of absolutely unprotected individuals is undoubtedly the great and the chief cause of the prevalence of smallpox; but the defective character of the vaccination in many cases is an element in the consideration also of some considerable importance. The badness of the vaccination in vaccinated individuals arises from a variety of causes. It is to be feared that the lymph is badly chosen in many cases, taken too soon or too late, or taken from vesicles which are not good vesicles. It is far too generally believed that these are matters of no consequence. In the next place there is the want of arm-to-arm vaccination. The results of the observations as to the difference of the insertion success with fresh and preserved lymph made by Dr. Buchanan, and to which attention has been already directed, are very remarkable, and strikingly exhibit the necessity for a systematic arm-to-arm vaccination. Preserved lymph should be used, as already remarked, only exceptionally. The practice should be to vaccinate from arm to arm. Another element in "bad" vaccination is "smallness of the number of takings." It is too generally surmised that to make the vaccination take in one or two places is enough. The observations of Mr. Marson and others bearing on this question, and which have been related to you conclusively demonstrate the erroneousness of this impression.

The practical difficulties encountered in vaccinating affect materially the result of the vaccination. We are frequently obliged to postpone vaccination from the unfitness of the recipient. Sometimes the operation has to be repeated more than once before it can be made to succeed. Then the results have to be watched, and cases in which the vaccination has not succeeded sometimes do not a second time come under observation.

In the next place, a continuous succession of good lymph is exceedingly difficult to maintain, especially in the case of private practitioners, and practitioners who have not a large number of cases to deal with. In order to obviate these latter difficulties, it is proper to recommend that vaccinations should be performed at certain times of the year, twice or three times, where the number of cases to be vaccinated annually is

small. Unless the number of cases be considerable, weekly vaccination is not advisable, inasmuch as it is difficult to maintain the supply of lymph in this manner.

One supposed cause of defective power of protection in vaccination as at present practised is deterioration of the lymph, which has now been used for many years, and excepting a few instances, without recurrence to the original source. Statistics adducible on the subject certainly appear to prove that the lymph is not so efficacious as it used to be. The present vaccine vesicle is not such an intense form of disease as it was some years ago. Data respecting it will be found in Mr. Simon's work, as also in an able pamphlet on "Smallpox and Vaccination" published more recently by Dr. Collinson, and hence, in the opinion of many, it is desirable to employ a new lymph as a substitute for that generally used at the present time. As one out of several causes tending to impair the protective power of the vaccination, this question is one deserving the practical attention of the profession, and particularly in connection with the discredit into which bad lymph is liable to bring vaccination in the public eye. It is hardly necessary to observe that it would be absurd to suppose that the general use of a new lymph would by itself be enough to meet the present evil.

It is not too much to expect that the time will come when deaths from smallpox will be reckoned among the medical curiosities of the day; but in order that this desirable consummation may be arrived at, the practice of vaccination must be universal. There can be no doubt that the profession individually are desirous of lending their best assistance in carrying out an efficient system of vaccination; but individual efforts extend only to limited areas, and there is required a central regulating supervision of the whole population in regard to vaccination, in order to secure for the community the inestimable advantages of that protection from smallpox which vaccination offers.—*Lancet*, June 27, 1863.

HOSPITAL NOTES AND GLEANINGS.

Whooping Cough treated with Bromide of Ammonium.—Of the various diseases submitted to the treatment by Dr. Gibb with

the bromide of ammonium in 1862, whooping-cough was included amongst the number, and some twenty-two children were mostly cured by its administration alone at the West London Hospital. Since June last a certain number have been also treated at the Westminster Hospital, of which the following is a short summary:—

CASE 1.—Henry D—, aged seven, had whooped for two weeks, preceded by catarrh for ten days. The cough was so severe and the spasms were so prolonged that his mother stated he had been nearly choked several times. They occurred every hour, more frequently towards night. Four grains of the bromide of ammonium were ordered three times a day. At the next visit the cough was better and the whoop less frequent, the spasms also were not so severe nor so frequent. At the third visit (seventh day of treatment) the whoop had ceased, the spasms had degenerated into a mild cough, and the pertussil nature of the disease had changed. He was now put on an ipecacuan mixture, which dispelled the cough in a few days, and she was cured.

CASE 2.—Sarah D—, aged two years and a half, sister of the above, the symptoms being similar, and commencing at the same period. She was ordered two-grain doses of the bromide thrice a day in a drachm of water. The whoop ceased sooner than in her brother, and she was well a week earlier, and convalesced more rapidly.

CASE 3.—Thomas C—, aged four, first applied on the 24th of June. He has had pertussis three weeks, with a whoop for ten days. The spasms were extremely violent, frequent, and prolonged, and were followed by hemorrhage from the eyes and nose. The ocular conjunctivæ were red and chemosed from effused blood. One-grain doses of the bromide were given thrice a day in two drachms of aromatic mixture. All the active symptoms had subsided in three weeks, and the hemorrhage ceased. He was then put on quinine and iron, and quickly convalesced.

CASE 4.—Margaret H—, aged fourteen months. She has had pertussis four weeks with whoop for sixteen days. The symptoms were mild. Four grains of the bromide were ordered thrice a day in peppermint water. On the seventh day the cough was very much better, with little or no expectoration. She had whooped but

once since taking the medicine. On the twenty-first day the whoop had gone, there was but little cough, and no expectoration. Her mother said "she had got on beautifully."

CASE 5.—Caroline O——, aged fourteen months. Had had pertussis one month, with the general symptoms mild, as in the preceding case. She was ordered three grains of the bromide in a drachm of ipecacuan mixture, and so quickly recovered that her mother did not think it worth while to bring her again after the second visit.

CASE 6.—Maria R——, aged four years. Ill six weeks with catarrh and whoop, the spasms being extremely frequent and very distressing. She was ordered six grains of the bromide thrice a day in peppermint water. This patient was very delicate, and, although the whoop slowly diminished, the cough remained persistent for some weeks, requiring other treatment to effect a cure, especially cod-liver oil.

CASE 7.—Ann R——, aged two years, sister of the above patient, with similar symptoms and equal duration of the pertussal complaint, was treated with half the dose of the bromide given to her sister. She improved more satisfactorily and much quicker, being comparatively well in three weeks.

CASE 8.—George A——, aged thirteen months. Had had pertussis two months. He was put on two-grain doses of the bromide three times a day. The whoop (not very frequent) ceased in twenty-four hours, and the spasms diminished in frequency and severity. The conclusion of the case was not known, as the mother ceased to attend.

CASE 9.—Ann M——, aged fifteen months. Ill with pertussis three weeks; and when first seen she was suffering with pain in the belly, was constantly moaning, and had some pneumonia of one lung. The whoop was not then frequent. She took three grains of the bromide of ammonium in a drachm of ipecacuan mixture four times a day, and was ordered a jacket poultice of linseed meal. She improved, and was better at the two next visits, and was then lost sight of.

CASE 10.—Henry B——, aged one year and five months. Had whooped one week only, and had the disease mildly. He was ordered three grains of the bromide in a drachm of ipecacuan mixture thrice a day, and in a week he was quite well.

CASE 11.—Emma Amelia S——, aged three years and eight months. Had had pertussis two weeks; she raved at night, and was feverish; the spasms occurred every two hours, and were so severe that, as her mother said, "she turned black in the face." Ordered four grains of the bromide in two drachms of water three times a day; with rhubarb, soda, and gray powder at night. She was better at the next visit, and then ceased to attend; whether she was cured or not is therefore uncertain.

In some clinical remarks made by Dr. Gibb, he stated that the foregoing cases were a few only that he had kept note of, as showing the value of the bromide of ammonium in whooping cough; and in some cases the results were satisfactory enough. If the little patients had been treated within the hospital wards, and carefully watched, the general results might have been more to be depended on; for although the children had mostly got well as out-door patients, yet they were liable to a recurrence of the disease on any unfavourable change of the weather, the result of their general exposure. Judging from his experience in these cases, and those also at the West London Hospital, he would say that whooping-cough, even in very bad cases, could be readily cured by the new salt of bromine; but, like many other remedies, it could not be expected to cure the disease invariably. Learning from experience the effects of the salt upon the mucous membrane of the entire body, but more especially of the upper respiratory tract, he thought that whooping-cough was one of those diseases that ought to be submitted to its influence, and in the general results he was not disappointed. As a permanent remedy, he had more faith in the dilute nitric acid given in pure syrup, when combined with topical application to the larynx of a solution of nitrate of silver; but as others had either found it useless or had not given it a trial, it was but right that other agents capable of curing the disease should be made known, and one of these was bromide of ammonium.

With regard to the dose: for infants, two or three grains three times a day are enough; to older children from four to eight grains may be given, and in some cases, where the symptoms are remarkably severe, even ten grains. The simpler the vehicle the better, but if there is a tendency to bronchial or

pneumonic inflammation it should be combined with either a mixture or the wine of ipecacuan.

The special nervous symptoms seem to be more under the control of the drug than the catarrhal, for the spasms diminish in frequency and severity, and consequently the whoop is not so often heard, showing a subsidence of the active symptoms. *Parvis*, the cure is not more speedy than from the dilute nitric acid in uncomplicated cases; nevertheless, it is worthy of a more extended trial, especially in severe and obstinate cases.—*Lancet*, Sept. 26, 1863.

Neuralgia treated with Solution of Morphia in Tincture of Iodine.—As a corollary to his remarks on the efficacy of tincture of iodine in the treatment of neuralgia, M. Bouchut adduced several cases from which it appears that when the remedy in its pure state has proved unavailing, the pain sometimes yields in a remarkable manner, when a certain amount of morphia has been added to the tincture. In this instance the application is not merely counter-irritant, indeed in this respect the fluid would seem to have lost some of its power; its efficacy is chiefly due to the presence of the sedative, the introduction of which beneath the epidermis is facilitated by the tincture of iodine. Whatever explanation may be offered of the effects of this mode of treatment, its beneficial operation is an unquestionable fact, deserving of every attention. Thus, we noticed in M. Bouchut's wards, a little girl, who, while recovering from typhoid, became affected with neuralgia of the forehead and temple; pure tincture of iodine failed in relieving the pain; M. Bouchut ordered the brow to be painted over three times a day with a solution of half a drachm of sulphate of morphia in half an ounce of tincture of iodine, and a cure was effected in the course of three days. The Professor adopted the same method of treatment in the case of a lady, aged 52, suffering from interscapular neuralgia, symptomatic of chronic pulmonary disease. Neither pneumothorax nor acute pleurisy were present; the pain was entirely caused by neuralgia of the second pair of intercostal nerves, and was especially intense in the neighbourhood of the sternum and along the edge of the scapula. Morning and evening the sedative tincture was applied to these regions, and on the second day amendment set in, and

the neuralgia was altogether removed on the fourth day.—*Dublin Med. Press*, Sept. 30, 1863, from *Journ. de Méd.*

MEDICAL NEWS.

DOMESTIC INTELLIGENCE.

Minie Rifle Ball entering the Abdomen and escaping by the Rectum.—Dr. FRANK H. HAMILTON records (*Am. Med. Times*, Oct. 17, 1863), the following example of this:—

On the twenty-ninth of March, 1863, I saw, in Hospital No. 8, at Louisville, Ky., Corporal John I. English, of the 5th Indiana Battery, who was wounded at Murfreesboro, on the thirty-first of December, 1862, by a conical ball, which entered just below and in front of the anterior superior spinous process of the ilium, on the left side. The ball escaped from the rectum on the fortieth day.

When I saw Corporal English he was in bed; the wound in front had closed, but matter continued to discharge by the rectum. His bowels were regular; but he was obliged to urinate often, and urination was attended with some pain. His health was steadily improving, and there was but little reason to doubt his final and complete recovery. The ball, which he showed me, was a little battered.

Pennsylvania Hospital.—Dr. WM. HUNT has been elected one of the surgeons of this Institution to fill the vacancy caused by the resignation of Dr. Norris. The appointment is generally regarded as a very judicious one.

Medical Classes in Philadelphia.—The session in our Medical Colleges opened on Monday, Oct. 12th. The number of students in attendance is, we are informed, much larger than it was last year or the year before.

Massachusetts Medical Society.—The annual meeting of this Society was held at Pittsfield on the 17th of June.

The following officers were chosen for the ensuing year:—

President.—Dr. Josiah Bartlett, of Concord. *Vice-President.*—Dr. Ebenezer Allen, of Randolph. *Corresponding Secretary.*—Dr. B. E. Cutting, of Roxbury.

Recording Secretary—Dr. W. W. Morland, of Boston. *Treasurer*.—Dr. Francis Minot, of Boston. *Librarian*.—Dr. W. E. Coale, of Boston. *Orator*.—Dr. J. Mason Warren, of Boston. *Anniversary Chairman*.—Dr. H. J. Bigelow, of Boston. *Committee of Arrangements*—Drs. W. E. Coale, Ezra Palmer, W. E. Townsend, Anson Hooker, and Francis Minot.—*Boston Med. and Surg. Jl.*, June 25, 1863.

Chicago Medical College.—The title of the Medical Department of Lind University has been changed to that of Chicago Medical College. A new building was in progress of erection for it, which is now probably completed.

OBITUARY RECORD.—It is with deep regret that we find in the *Boston Journal* the announcement of the death, by apoplexy, of our old friend Dr. Geo. Hayward. Dr. H. was one of the oldest and ablest surgeons of Boston, and a most hospitable, public-spirited, and high-minded gentleman. He was always foremost in aiding all useful objects, and his death will be a severe loss to the city of Boston and to the profession of this country.

FOREIGN INTELLIGENCE.

Perchloride of Iron as a Haemostatic.—The *Antwerp Journal* states that perchloride of iron combined with collodion is a good haemostatic in the case of wounds, the bites of leeches, &c. To prepare it, one part of crystallized perchloride of iron is mixed with six parts of collodion. The perchloride of iron should be added gradually and with care, otherwise such a quantity of heat will be generated as to cause the collodion to boil. The composition when well made is of a yellowish-red colour, perfectly limpid, and produces on the skin a yellow pellicle, which retains great elasticity.—*Lancet*, Sept. 26, 1863.

Contagiousness of Typhoid Fever.—M. HENRI GINTZAC, of Bordeaux, in a memoir read before the Imperial Academy of Medicine (July 28th, 1863), expresses the conviction that under certain still unknown circumstances, typhoid fever is contagious; and he gives an account of an epidemic of this disease which prevailed at Gabarnac, where the affection was evidently propa-

gated by contagion; it was successively communicated to twenty-two persons. In one case an infant took the disease from its wet-nurse; the child was sent to a new nurse at a distance and communicated the disease to the latter.—*Revue de Thérapeut. Medico-Chirurg.*, 15th Aug. 1863.

Exophthalmia.—A brilliant success in the way of operative surgery has lately been achieved by M. Maisonneuve at the Hôtel Dieu. A patient presented himself in July with symptoms of exophthalmia, which he had stated commenced a year previously, and had been progressing steadily. The ocular protrusion advanced until the organ was completely ejected from its socket, and vision entirely lost. M. Maisonneuve, convinced that the cause of the deformity was an exostosis springing from the inner wall of the orbit, by means of a V-shaped incision, the point of which lay upwards and on the middle line, entered the orbit, and, pushing aside the soft parts, reached the bony mass. This with some difficulty was removed by means of powerful forceps, and the protruded organ replaced into its natural cavity. The tumour which sprang from the ethmoid bone, proved to be as dense and hard as ivory, ovoid in form, and three ounces in weight. The patient recovered without a bad symptom, and, strange to say, eyesight and the power of moving the globe have completely returned. "But for the slight scar on the forehead," says M. Maisonneuve in his report to the Academy of Sciences, "no one would suspect what has occurred."—*Lancet*, Oct. 10, 1863.

Euterotomy.—DR. REALI relates the following case: A countryman of limited capacity had introduced a piece of wood into the rectum nine days before he applied to the Hospital of Orvieto, complaining of severe pain in the abdomen. On exploration the finger was able only just to reach the point of a piece of wood lying surrounded by the turgid mucous membrane in the direction of the hollow of the sacrum. Numerous attempts were made with various instruments to extract the foreign body without success, and, as the patient suffered greatly, an incision was made in the left iliac region. The finger having been introduced, it was found that the foreign body, having passed into the sigmoid flexure, this latter was distended, and forced to the mesial line, the

FOREIGN INTELLIGENCE.



body it contained rising as high as the navel. The intestinal wall was incised, and a truncated cone of chestnut wood (irregularly shaped, and measuring twenty-five centimetres in length, and from nine to ten in diameter) was removed. The wound in the intestine was closed by Jobert's procedure, and oily purgatives were administered. Great meteorism, entero-peritonitis, and an iliac abscess were among the sequels; but the patient recovered, and remained well when seen two years afterwards.—*Med. Times and Gaz.*, August 1, 1863.

Strangury from Cantharides.—Dr. AMVILLE, of Paris, extols the method of treatment introduced by Dr. MULOCK, of Dublin, for the cure of strangury from cantharides. This consists in giving liquor potassa, in doses of half a drachm, in gruel or flaxseed tea, every hour. Dr. A. says that he never finds more than two or three doses required to effect a cure.

Cinchona Bark from India.—At a late meeting of the Linnean Society, Mr. Howard exhibited specimens of cinchona bark sent from India. By analysis this bark has been ascertained to contain a percentage of quinine and the other febrifuge alkaloids fully equal to bark of the same species grown in South America. This is of great importance, as the gradual but certain destruction of the cinchona forests of America has been of late a subject of much anxiety.

Syphilis communicated through means of a Catheter.—Dr. Fournié has related to the Academy of Medicine a case of transmission of syphilis through the means of a catheter used for the catheterization of the Eustachian tube. M. Ricord also saw the case, and gives the same view of it. He added the following startling remarks. "This is the fifth syphilitic patient whom I have seen come out of the hands of Dr. — (the Eustachian-tube doctor); one of the five was a married woman. All of them had been catheterized a short time before the disease appeared, which it did in the nasal fossa or the back of the throat. Being convinced that Dr. — introduced poisoned and dirty catheters into the nasal fossa of his patients, I got a mutual friend to give him a hint; but he does not seem to have taken it." Dr. Fournié details the case at

length, so as to bring the cause of the syphilis pretty clearly home to the nasal catheter.—*British Med. Journ.*, July 25, 1863.

Bdellotomy.—The snipping off the tail of a leech engaged in sucking human blood, in order to let the blood run out of him, and so increase his powers of drawing blood, is an old and well-known operation; but it has two objections, and has never found its way into common every-day practice. It is only of partial utility, and destroys the leech. Dr. Julius Beer of Berlin has recently taken up the subject in a more scientific manner, and now proposes, as an excellent and useful practice, what he calls bdellotomy—*Anglicè*, leech-cutting. The leech is to be cut into scientifically at the lower part of the abdomen, in a somewhat transverse direction. In this way is opened the most posterior of the blind appendices of the intestinal canal, of which the leech has ten or twelve; and a free passage is made for the escape of the blood which the leech is sucking. In this way, one leech (bdellotomized) may be made to serve the purpose of several leeches used in the ordinary way. Dr. Beer especially calls attention to the advantage in the case of children, in diseases of the uterus and of the eye. He lays especial force on the advantages of the method in the latter case; *bdellatomia ophthalmatherapeutica* he calls the treatment. The operation does not appear to interfere with the due performance of his medical duties by the leech; and Dr. Beer says that one such leech generally does all that is wanted. When such a leech is removed from the place where he is sucking, he will take hold at another place; and so on again and again. Dr. Beer says that he has had leeches, thus prepared, who for six days running performed their duties in this way, passing off the blood either through the original wound or through a freshly made one. He measures the quantity of blood obtained by letting the tail end of the leech hang in a glass containing distilled water. Three objects are gained by this method, he tells us: 1. Humanity suffers less; 2. Economy is promoted; and 3. Precision is introduced into the art of local blood-letting.—*British Med. Journ.*, Aug. 29th, 1863.

Physiological Effects of Sulphuret of Carbon.—Dr. DELPECH, a Professor of the

School of Medicine, has recently published some important observations on the evil effects of the sulphuret of carbon and other noxious substances employed in certain trades. Sulphuret of carbon is a transparent, exceedingly fluid, and highly volatile liquid, possessing a characteristic and disagreeable smell; it is one of the most dangerous substances known in chemistry, but unfortunately also one of the most useful. Its chief property is that of dissolving India-rubber with the greatest ease, whence it follows that it is extensively used in the factories where that substance is blown into bladders for various purposes. The vulcanization of India-rubber—that is, the operation by which it acquires the valuable property of increased elasticity and insensibility to a degree of heat which it otherwise could not bear, is chiefly effected by sulphuret of carbon, aided by chloride of sulphur, although it might be equally obtained in certain cases by sulphur alone. But the men engaged in this work are exposed to the effluvia of the sulphuret, which in a short time causes headache, vertigo, and an over-excitement of the nervous system. The patient talks with great volubility, sings incoherently, or laughs immoderately, or else hides himself and weeps. This state may even lead to lunacy, and at all events will cause obtuseness and imbecility. To obviate these serious effects, Dr. Delpach recommends a glass screen to be placed between the workman and his table, leaving two holes for the hands and arms; these also are to be protected by ample sleeves of waterproof stuff. Another hole is to be left for the nozzle of the bellows which they use to blow the India-rubber into balls. These precautions, Dr. Delpach thinks, ought to be enforced by the authorities.—*Med. Times and Gaz.*, Oct. 3, 1863.

Smallpox and Vaccination.—Dr. LETHEBY refers in his recent quarterly report on the Sanitary Condition of London, to the recent outbreak of smallpox, and to the increase of scarlatina. He remarks that these sudden and severe outbursts of zymotic disease show that the force of these maladies is not exhausted by sanitary measures, but only kept in check; and that when occasion serves, as in this instance, by the neglect of proper precautions, the force manifests itself with all its original

vigour. In the case of smallpox, which has twice appeared among us in an epidemic form during the last three years, it is evident that the disease has acquired the mastery through a disregard of proper and effective vaccination. A sort of vaccination has, no doubt, been performed, and a false confidence has been placed in its protective power, but it has utterly failed to ward off the attacks of the disease, or even to modify its severity. In the course of this and the former epidemic of 1859-60 he had caused inquiries to be made into the particulars of 508 cases of the disease, 108 of which were fatal; and he was told that in 323 of these vaccination had been performed in infancy, and that the operation had taken well. He had had no opportunity of ascertaining whether, in these cases, the evidences of successful vaccination still remained upon the arm; but he had no doubt that in a large proportion of them the operation was done in an imperfect manner; it was merely a formal act; the arm was punctured and the wound touched with lymph that had no power in it, and there was an end of the matter. In all probability the case was never seen again, and as there was a little irritation, or perhaps a false vesicle, upon the arm, it was thought that the operation was successful and complete. This is the danger, for it afforded no protection to the patient. Again, he ascertained that 114 of the cases had not been vaccinated at all, and of these 44 died. This is the usual mortality. Mr. Marson, the resident surgeon of the Smallpox and Vaccination Hospital at Highgate, had stated that in the course of his large experience he found that when smallpox attacked persons who had not been vaccinated it killed 36 per cent. of them—that is, one in every three died; but when vaccination had been performed, the death-rate of those attacked by the disease fell to 6.76 per cent., or to one in every 15. And, more remarkable still, he found that the protective power of vaccination was in proportion to the way in which it had been done. If after the operation there remained permanently on the arm but one scar or cicatrix, the mortality from the disease was 7.57 per cent.; if two scars, 4.13 per cent., if three, 1.85 per cent.; and if four scars, not one in a hundred died, the mortality being only 0.74 per cent. But then, again, not all who have been merely cut in the arm, and, as they think, vaccinated, are pro-

tected; for though the operation may have been done in infancy, if no scar remains, 22 per cent. will die if they catch the disease. It is the remaining scars, therefore, upon the arm which tell of the success of the operation, and of the protective power of it. And not alone does it save from death when the disease has come, but it is far more powerful in keeping off the disease altogether. With these facts—and they have been before us for many years—is it not strange that some more effective measures are not taken, even by the people themselves, for the universal and proper performance of vaccination? It would seem that there is a feeling of carelessness about the necessity for the operation, and even when it is done no pains are taken to ascertain if it has been successful or not. There is manifestly wanted a means of determining what relation exists between the number of children born and the number of successful operations. There is also wanted a better means of insuring and maintaining the power of vaccine lymph. At present it is more than doubtful whether the processes adopted for the preservation of the lymph are not all imperfect; and, seeing how much more successful is the operation when performed with lymph taken at once from the ripe vesicle upon the arm, and not from dried points or capillary tubes, it is an important question whether in every large town, where it is so easy to keep up a constant succession of cases, this should not be the invariable method of performing the operation. To this end the number of vaccinators should be reduced as far as possible, and it should be the task of one or two officers to perform this duty for a large district. The advantage of such an arrangement would not only be in the perfect conservation of the lymph, but also in the proper performance of the operation; for, although it seems but a very simple affair, it really requires a great amount of skill and experience to insure its success. These observations are forced on us by a contemplation of the frightful effects which these epidemics occasion; and it is only while the force of the disease is in action, and the danger is imminent, that the public can be brought to regard the matter in a proper light and with sufficient attention. Therefore it was he had brought it so prominently under notice. Dr. Letheby further adds that the inquiries which he had instituted

showed how terribly the disease spreads in the crowded districts when it once gets a footing. He knew instances of every member of the family being stricken with it, and of from five to thirteen persons in a house being affected. He mentioned Blue Hart-court, Golden Lion-court, Elliott's court, Turner's-square, and New-street, Cloth-fair, as examples where the disease had so prevailed. All these, he says, are places where the poor are congregated, and where the habits of the people are not cleanly.—*Lancet*, Aug. 15, 1863.

Death-Rate in Smallpox.—MR. MARSON, the resident surgeon of the Smallpox and Vaccination Hospital at Highgate, states that of unvaccinated persons who are attacked 36 per cent. die, whilst of those attacked after vaccination the mortality is 6.76 per cent., or 1 in 15. And, further, that if after the operation there remains permanently on the arm but one scar, the mortality is 7.57 per cent.; if two scars, 4.13 per cent.; if three, 1.85 per cent.; and if four scars remain the mortality is reduced to 0.74 per cent. Facts like these, backed by the experience of a man like Mr. Marson, ought surely to be sufficient to silence, if not to convince, the rabid opponents of vaccination. We should have been glad to learn from a gentleman of the unusual experience of Mr. Marson the influence which revaccination exercises upon the occurrence and fatality of smallpox. What is the real influence of secondary vaccination? At what period should it be performed? Is it necessary immediately after puberty or at the termination of every seventh year? These are questions of vital import, and no doubt Mr. Marson will feel it his duty to give an answer to them. Without anticipating his reply, we may state that in a practice of no considerable extent not a single case of smallpox has occurred after revaccination. There is no question in which the public are interested that has a more important bearing upon the general welfare than this. There is none, probably, upon which there is a greater diversity of opinion. The records of the Smallpox Hospital, we think, ought to afford something like a satisfactory answer. It would be greatly conducive to a settlement of this question if Mr. Marson would state his experience upon this point. No man is more competent by his long

experience, and by the unbiased judgment which he can give upon such a matter, to relieve the anxiety of the public upon a disputed question than the highly respected resident surgeon of the Smallpox and Vaccination Hospital.—*Lancet*, Aug. 15, 1863.

The Sanitary State of the British Army in India.—The Royal Commission appointed in 1859 to investigate the sanitary state of the British Army in India has made a most searching and comprehensive report. The *British Medical Journal* (July 18, 1863) in commenting on this document very candidly observes: "We have hitherto held India at a cost of European life which it is shocking to think of, since it has been mainly due to the neglect of the commonest precautions if the report be true.

"We had more than 90,000 soldiers in India in the year 1860, and more than 80,000 in the year 1861. The great majority of these are picked men in the prime of life, and the mortality of men of the same age in the healthy parts of England and Wales is at the rate of 8 in 1,000. In great towns and cities subjected to unfavourable conditions of health the rate varies from 9 to 12 in 1,000. There is no apparent reason why the mortality of our army at home in time of peace should exceed from 8 to 10 in 1,000. Until recently, however, it was no less than 17 in 1,000, though it is "now declining in proportion as the causes of disease are abolished or mitigated, and has already sunk to about 10." But this exaggerated death-rate of 17 per 1,000 must not only be doubled, but quadrupled, before it can be compared with the Indian standard. In one year, indeed—1852—it was as low as 41, but the general range has been from 58 to 80, 90, or 100. It was actually as high as 134 in 1804, during the first Mahratta war; averaged 85 from 1800 to 1829, and has stood at 69 for the whole of the present century. It is now a little below this, but the Commissioners consider that there has been little variation since our first occupation of the country. The inference is obvious, though it is so appalling as to be hardly credible. "Besides deaths by natural causes," which would be represented by 9 in 1,000 "60 head per 1,000 of our troops perish in India annually. It is at that expense that we have held dominion there for a century; a company out of every regiment has been sacrificed there

every twenty months. These companies fade away in the prime of life, leave few children, and have to be replaced at great cost by successive shiploads of recruits."

And next comes the grand question—what is the reason of this frightful loss of life, and how far is it preventable? To this the Commissioners answer, that it is not solely or mainly the climate which decimates our army. "Endemic diseases," and particularly fevers, diarrhoea, dysentery, cholera, and disorders of the liver, occasion by far the larger proportions of the mortality. Malaria, and the joint agency of heat, moisture, and rapid changes of temperature predispose the constitution to these diseases, but it is the open neglect of sanitary laws which gives them their deadly virulence. The stations have generally been selected without reference to health, and often occupy low, damp, and undrained situations. The towns and bazaars in their immediate vicinity teem with every nuisance that can breed pestilence under a tropical sun. An utter want of drainage, an impure water supply, defects in building and ventilation, imperfect means of ablution and cooking, and a bad system of barrack and hospital arrangements, combine to aggravate the effects of atmospheric conditions. Intemperance, sedentary habits, *ennui*, and self-indulgence fill up the list of the circumstances to which the Commissioners primarily attribute the excessive sickliness of our troops, and by comparison with these they consider the influence of climate "altogether secondary." The proof of this lies, not only in the express testimony of medical authorities on these points, but in the returns of mortality among officers and civilians, as well as among private soldiers, at those few stations where the evils pointed out have been partially corrected. Here the death-rate is no more than 20 in 1,000, and if the same improvement could be brought about, as it well might, all over India, 1,460, instead of 5,307 recruits would suffice to fill up the death vacancies in the proposed establishment of 73,000 men.

Ventilation of Hospital Wards.—The following ingenious method of admitting a continuous supply of pure air around each bed in a sick ward has been found very beneficial in the hospital at Hobart Town, Tasmania, and is being adopted in other similar institutions in Australia. We quote

from a letter of Dr. Swarbeck Hall, who suggested the plan, which has been successfully carried out by Dr. Smart, the medical officer of the hospital:—

"The space beneath the floor of the ward has been converted into an isolated fresh-air chamber, supplied abundantly with external air by a large guarded aperture in the wall, and regulated by a pulley door. The pulley chain will be under the charge of the nurse inside the ward, and, by graduated hooks, the admission of fresh air can be increased or diminished systematically. Each bed is elevated on a wide box platform about six inches high, and so much wider than the bedstead as to allow a convenient step for a patient's legs to rest upon. The sides and ends of the platform are panelled with fine gauze wire. A spacious opening through the floor within this special air chamber admits the fresh air from the general air chamber, and a current almost imperceptible from its extensive division, unremittingly flows through the gauze wire into the ward all round the patient's bed. The vivified air that rises to the top of the room finds an outlet through an Arnott's ventilator into the chimney, the aperture of exit giving eight cubic inches to each bed. The fresh air in this arrangement will always be supplied on the *plenum* principle in the natural ascensional manner."—*Lancet*, Oct. 10th, 1863.

Drought in the West Indies.—A drought of more than twelve months' duration in the West Indies has caused much suffering and disease to the inhabitants; no rain having fallen in Guadaloupe and other islands of the Antilles since August 16th, 1862. The mortality among the white population has been very great.

Effects of Congelation on Water.—Dr. ROBINET, of Paris, has published an account of experiments conducted by him to test the effects of congelation upon drinking-water. It is well known that the ice which is formed in the sea yields nothing but fresh water, all the salt having been eliminated by congelation. In the northern parts of Europe this property is turned to account for the extraction of salt from seawater; for a large sheet of the latter having been left to freeze, the ice is afterwards cut away, and the unfrozen water left below is so rich in salt as to require very little eva-

poration to yield it in a solid state. This property will also serve to analyze wine. Suppose it was required to determine the quantity of water fraudulently added to a certain wine; by exposing it to the action of artificial refrigeration, all the water would be alone, and the wine left in its purity. By a similar process, ships at sea, being short of water, might be supplied with this necessary article. We will suppose the temperature of sea-water under the tropics to be 300 centigrade. If a quantity be exposed in a vessel to the action of a mixture of sulphate of soda and hydrochloric acid, two very cheap commodities, the temperature of the water will fall to 100 below the freezing-point. Let it then be exposed to a second mixture of the same kind, generally eight parts of sulphate to five of the acid, and the temperature may be lowered to 170 below freezing-point. Congealed water is then obtained free from salt, and may be used with impunity. Dr. Robinet has added a new fact to this theory by showing that the water of springs and rivers loses all its salts by congelation. These salts are chiefly those of lime and magnesia. The water subjected to experiment was that of the lakes of the Bois de Boulogne, the ice of which was found to be entirely free from the above mentioned salts. Such is the chemical purity of the water thus obtained, that it may in most instances be substituted for distilled water.—*Scientific American*.

Mode of preventing Injurious Action of Lead Pipes on Water.—The importance of discovering a really efficient means of preventing the injurious action of lead pipes on water is universally acknowledged, and the experiments of Dr. Grace Calvert have proved beyond question that no proposition hitherto brought forward has been calculated to remedy the evil complained of. A discovery, however, has now been made through which the water supplied by leaden pipes may be obtained by the consumer as pure as from the original source. Dr. H. Schwartz, of Breslau, has discovered a means by which the portion of the lead forming the interior surface of the pipe may be converted into an insoluble sulphide, the natural consequence being that the water passing through will be as free from contamination as if glass were used. The means by which Dr. Schwartz effects this conversion are ex-

tremely simple. He simply passes a strong solution of the sulphide of an alkali through the pipe to be acted upon, and the process is completed. This solution, which is either a sulphide of potassium or of sodium, is used at a temperature of about 212° F., and is allowed to act upon the metal for ten to fifteen minutes. It is stated that, in practice, the boiling solution of caustic soda and sulphur is found to answer every purpose.—*Med. Times and Gaz.*, Sept. 26, 1863, from *Mining Journal*.

Test for Grease.—If whilst camphor is actively moving over water, the most minute particle of certain greasy substances only touches the water, instantaneously, as if by magic shot, the camphor is deprived of all motion, and repelled. The scene of previous activity is changed to the immobility of death. By availing ourselves of this curious property of camphor, we may detect grease in quantities so extremely minute, as would almost appear fabulous.—*Ibid.*

Sewage.—Sir EDWARD BULWER LYTTTON made lately the following interesting remarks on this subject:—

"I remember, when I held the Colonial seal, the trouble and toil it cost me to secure from some distant islands a scanty supply of guano, while all the time, close at hand, a few of the London sewers were every year casting away into the Thames more than half a million's worth of a manure considerably more valuable for the general purposes of agriculture than that guano which ships were fitted out to bring home, in order that it might be retailed at a price which rather fits it for the phials of an apothecary than the fields of a farmer. I said half a million's worth of money was thus thrown away, but that is a very low estimate of the real waste. In Flanders, for instance, where I have been lately, the value of sewage is calculated according to the numerical population, especially in towns. It is there calculated at £1 7s. a head yearly. In Belgium it is calculated at a still higher rate. So that, if the population of London be taken at 2,000,000, a means of increasing the productive wealth of the country (which, according to the estimate of Flanders, would be worth about £2,700,000) is exclusively devoted to poison the waters of the Thames, and administer gratuitous disease to her Majesty's metropolitan subjects. If we may condescend to take lessons from barbarians, the Chinese may in this respect be our teachers. The rapidity with which the Chinese bring almost any soil into cultivation, and, when brought into cultivation, the enormous crops which they contrive to take from mere handfuls of land, have been the wonder and admiration of travellers. But the great secret of the Chinese is in the utilization of sewage. The proverbial fertility of Belgium is owing, in much, to the same cause. But it is not only the sewage of London which is wasted, but that of all our rural towns; although in them there appears a more impudent desire to remedy acknowledged abuses than seems to be the characteristic of city aldermen and metropolitan boards. When I consider how many populous towns there are in this country, I heartily wish we could send among them a few enlightened Chinese engineers to devise the best practical means by which our townsfolk might be enriched by the manure they could sell, and our farmers enriched by the manure they could buy. But in the meanwhile, until some such scheme is devised and agreed to, we must fall back on our friend the farm-yard dunghill, assisted indeed by various chemical manufactures, but never to such a degree as to supply its place. Professor Liebig is, no doubt, right in considering the chief art of productive husbandry to consist in the skilful application of manure. David Hume tells us, in one of his essays, that all the vast apparatus of our government has ultimately no other object or purpose than the distribution of justice, or, in other words, the support of the twelve judges. So it may be said that all the apparatus of productive husbandry has ultimately no other object or purpose than the distribution of justice to the soil—in other words, the application of that manure which gives back to the soil the nutriment we take from it, or supplies the nourishing properties which Nature had neglected to bestow. Eight hundred years ago there was a very learned dispute whether or not the earth was an animal. We have now discovered that the earth is so far an animal that it requires to be fed, and will not bear to be starved. A remarkable instance of this truth is mentioned, by a celebrated agricultural authority, in some of the Southern States of America—such as Mary-

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1861, and the cod and ling caught were certainly not a tithe of those left behind, the destruction of herring by those voracious fish alone may be estimated at ten times as great as that effected by all the fishermen put together. But the conger and the dogfish probably do as much mischief as the cod and ling, the gulls and the gannets slay their millions, the porpoises and grampus destroy untold multitudes, sea trout and innumerable other fish prey upon the herring fry, flat fish of all kinds resort in immense numbers to the spawning grounds of the herring to prey upon the freshly-deposited ova. Extensive as our fishery operations are, their effect upon the supply of herrings becomes inappreciable when compared with all these consuming agencies. The Royal Commissioners, who have recently inquired into the operation of the laws relating to herring trawling, and from whose report these statements are taken, notice the practical result of all this: A plentiful production of herrings in any year nourishes and supports an increased army of enemies, and if these latter multiply too fast the herrings become diminished in number, whereupon the fish that destroy them are starved down, and, in a weakened state, more easily fall a prey to their own enemies; the herring, then, relieved from their oppressors, in a year or two appear again in immense numbers, and so the alternations of prosperity, over production, and panic in the trade which they originate, will occur with as much regularity as if the herring were manufacturers.—*British Med. Journ.*, Ap. 4, 1863.

Life in the Atmosphere.—JAMES SAMUELSON, Esq., in a paper read before the British Association at their late meeting, remarked that no subject in natural history, except the allied one, the origin of species, had of late excited greater interest in the scientific world than the origin of the lowest types of living beings on the globe; and although the problem was far from being solved, yet the investigations that had accompanied the discussion had already served the useful purpose of throwing new light on the anatomy and life history of the mysterious little forms of which it treated. It was rather with the latter object, than in the expectation of being able to assist in the solution of the general question, that he

ventured to lay before the association the results of investigations recently made. He had, for example, taken rags imported from various countries, and shaken the dust from them into distilled water, which he then exposed to the atmosphere; and, after describing generally the character of the living forms he had discovered in this pure water, he stated in detail the forms of life found in each kind of dust, and among these were some new species of Rhizopoda and Infusoria, and an interesting ciliated worm-shaped form, which he believed to be a collection of the larvae of some other infusoria. The general results of the microscopic examination of these fluids between the 27th of July and 15th of August were as follows: In the dust of Egypt, Japan, Melbourne, and Trieste, life was the most abundant, and the development of the different forms was rapid. In conclusion, he observed that if he was correct in supposing the germs of the living forms that he had described to be present in the dust conveyed by the atmosphere, and in distilled water, it was worthy of notice that these germs retain vitality for a long period—a period of which he could not pretend to define the limit. In his experiments they outlived the heat of a tropical sun, and the dryness of a warm room during the whole winter; but in Dr. Pouillet's case they retained their life 2000 years, for he obtained his from the interior of the pyramids of Egypt, and then survived an oil of 400 degrees of heat. A main purpose which Mr. Samuelson had in view was to disprove the theory of spontaneous generation; and he suggested whether the great rapidity with which these germs are multiplied might not account for the spread of epidemic diseases. He did not profess to have any acquaintance with such diseases, but might it not be desirable to subject the atmosphere of hospitals to the microscopic test!—*Medical Times and Gaz.*, Oct. 3, 1863.

New Works and New Editions.—Quite a large number of new books and new editions are announced as preparing for publication in Great Britain. Among them may be enumerated the following:—

Professor Syme promises a new edition of his "Principles and Practice of Surgery," Dr. Macleod, of Glasgow, is

going to publish some "Outlines of Surgical Diagnosis," and Mr. Gant, "The Principles of Surgery, Clinical, Medical, and Operative." Amongst new books on special Surgical topics we are to have from Mr. John Wood, "A Surgical Anatomy of the Pelvis and Perineum in the Infant, Young, and Adult Male and Female;" from Mr. Nunn, "The Ward Manual; an Index of Surgical Disease and Injury;" from E. Canton, "A Treatise on the Arteria Senilis;" from Mr. Bryant, "The Lettoman Lectures on Surgical Diseases of Children;" and from Mr. Gangee, "Some Clinical Lectures on Fractures of the Limbs." In the department of pure Medicine we may expect a second edition of Dr. Aitken's "Science and Practice of Medicine;" a new book on Medicines, i. e., *Materia Medica*, by Professor Garrod; a fourth edition of the well-known "Manual" of Dr. Royle and Dr. F. Headland; and a "Manual of Practical Therapeutics" by Mr. Waring. Most of these works on *Materia Medica* will not appear till the new *Pharmacopoeia* is published. In the Obstetric Department, the venerable Dr. R. Lee proposes to publish some "Consultations in Midwifery." Dr. Hall Davis, a new edition of "Difficult parturition;" and Dr. Swayne, a fourth edition of his "Obstetric Aphorisms." "Diseases of Women" will be treated of in a new work by Dr. Graily Hewitt; and Mr. Spencer Wells will bring out his promised work on the "Diagnosis and Treatment of Diseases of the Ovaries." Amongst monographs we see announcements of works on the "Throat and Laryngoscopy," by Dr. C. Gibb; a second edition of "Dr. L. Beale on the Urine, Calculi," etc.; a new work on "Intra-Thoracic Cancer," by Dr. Cockie; one on "Arrest of Phthisis," by Andrew Clark; and on "Paralysis," by Dr. Mervon. Diseases of the skin are treated of in new works by Drs. Tilbury Fox, M'Call Anderson, J. L. Milton, and David Logan. We also see advertised a new "Manual of Comparative Anatomy," by Professor T. H. Huxley; one on "Practical Anatomy," by Mr. C. Heath; one on "Animal Chemistry," by Dr. Thudichum, and a "Manual of Practical Hygiene," intended especially for the Medical officers of the army, by Professor E. A. Parker.